Mono Lake Background

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Introduction

Mono Lake is a large, shallow, alkaline and hypersaline lake in eastern California about 300 miles north of Los Angeles and 190 miles east of San Francisco. The lake is located in Mono Basin, a 695 square-mile closed hydrographic depression at the transition between the eastern Sierra Nevada mountain range and the Great Basin desert region. With a surface area of about 70 square miles, is the second largest lake in California and one of the oldest in North America. It is a remnant of a much larger body of water that covered much of the surrounding Great Basin region after the melting of glaciers 700,000 years ago.

Mono Lake is fed by entirely by inflows from the local watershed and by direct rainfall onto the lake surface. As such, its water surface elevation can fluctuate considerably. It currently has a maximum depth of 150 feet, and averages about 60 feet in depth. Because the lake lies in a closed basin with no natural outlet except for evaporation, minerals and salts have accumulated in its waters for thousands of years. After the last glaciation, the lake emerged in its present alkaline/saline chemical composition. There are three main sources of minerals found in the lake. Sulfates leach from volcanic rocks and granitic rocks within the basin, salt and chlorides derive from desert saline soils, and carbonates result from the breakdown of local igneous rocks. The high carbonate concentration causes the lake water to be highly alkaline, with a pH approaching 10. Currently, the lake has a salinity of about 81 grams per liter (g/l) or about 2 ½ times as saline as the Pacific Ocean.

Biological Values of Mono Lake

Mono Lake supports a simple yet productive ecosystem that provides significant benefits for wildlife. Benthic and planktonic algae are the foundation of the food chain in the lake. The primary consumers are aquatic arthropods, mainly the pelagic brine shrimp and in more near-shore areas of the lake (littoral zone) the Mono Lake alkali fly. Other insects, such as the deer fly, the long-legged fly, and the biting midge also occupy the littoral zone, but these species are much less abundant than the alkali fly.

The algae in Mono Lake are fairly resistant to increased salinity, although their productivity is likely to decrease gradually at salinities above 100 g/l and more rapidly above 150 g/l. The alkali fly and brine shrimp are among the few species that can tolerate conditions of salinity and alkalinity as extreme as those of Mono Lake. The high salinity and alkalinity of the lake have direct physiological effects on the abundance of the alkali fly and brine shrimp populations and influence other important physical and biological features of their habitats, such as patterns of lake mixing, production and species composition of algae, and population levels of potential predators and competitors.

The alkali fly and brine shrimp are the major food source for the lake's large seasonal bird populations. Because of this abundant food source, the lake is considered a vital stop along the Pacific Flyway for millions of migratory birds. More than 325 species of birds use Mono Lake and its adjacent habitats within the Mono Basin watershed. The lake is part of the Western Hemisphere Shorebird Reserve Network, a collection of critical migratory bird habitats in North and South America that provide important roosting, foraging and breeding areas for migratory and resident birds.

Migrating eared grebes, Wilson's phalaropes, red-necked phalaropes and California gulls are among the most common avifauna found around Mono Lake. The lake supports nearly one-third of the North American population of eared grebes, about 3 percent of the world's population of Wilson's phalaropes, and is the primary breeding area for roughly 85 percent of the state's California gull population - making it second largest California gull rookery in North American after the Great Salt Lake. Other migratory shorebird species found at Mono Lake include American avocets, snowy plovers, killdeer, western and least sandpipers, white-faced ibises and dowitchers. Hundreds of thousands of other migratory waterfowl such as Canada geese, mallards, northern sholvers, northern pintails, gadwalls, ruddy ducks, cinnamon teals, green-winged teal, plus many others are locally common fall visitors around the lake.

The watershed also supports a rich assemblage of plants and animals. More than 1,100 species of plants are found in the Mono Basin. The streams that feed the lake are oases for songbirds and piscivorous birds, such as osprey and belted kingfisher. Pinyon pine forests and sagebrush attract mountain bluebirds, and sage grouse, as well as kangaroo rats, pocket gophers, mule deer, and coyote.

Educational and Recreational Values of Mono Lake

The Mono Basin annually attracts about 250,000 visitors. Popular pursuits include hiking, boating, swimming, sightseeing and photography. To protect sensitive wildlife areas from disturbance, there are some restrictions on boating and hiking, and sightseeing is generally concentrated in designated use areas.

In addition, many opportunities to enjoy as well as learn about the unique features of Mono Lake have developed over the years. Organizations such as the Mono Lake Committee, the U.S. Forest Service - Inyo National Forest, and the California State Department of Parks and Recreation have programs to help educate the public and provide activities and exhibits on the natural and human history of the Mono Basin.

Mono Lake Tufa State Reserve was established to preserve "tufa towers," calcium carbonate spires and knobs formed by the interaction of fresh spring water with the alkaline lake water. The Reserve provides tours (including cross-country ski tours) and bird walks on a seasonal basis through a cooperative effort of the State Reserve, U.S. Forest Service, and the Mono Lake Committee.

Source of photo: *http://www.livinglakes.org/mono/*